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PATRICK BURKE'S

KNOWLEDGE OF AGRICULTURE

IN THE

EIGHTEENTH DISTRICT OF NEW YORK.

FORT COVINGTON, N. Y.,  
RECORD PRINTING HOUSE,  
1874.



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Fort Covington: Printed by W. E. Manson.

## INTRODUCTORY.

IN 1859 I rented out my place which I had in Brasher, and that same year I attended the Agricultural Fair in Canton. I saw a great many things at the Fair: the showmen, the trotting horses and many other things, and I heard some very good music; but I did not learn anything about how farm work ought to be done although I listened very attentively to the agricultural addresses. I have noticed a great failure in the covering of drains. I called upon Mr. Solomon Walrath to see if he knew more than I did about draining. Mr. Walrath is a good farmer; he received a premium from the State Fair for underdraining; I told him I came to him to find out whether he or I knew the most about underdraining. I told him if he knew more than I did I would be willing to acknowledge it, and he said he was willing to do the same; but on coming to the real statement of the case he did not know how to drain his own land, to say nothing of laying down rules for others to drain land, which fact he acknowledged, and his acknowledgement was printed at the time and is in print yet in the files of the *St. Lawrence Republican*, in Ogdensburg. I, also, saw many stables where the cattle were improperly cared for, and so filthy that they had to be cleaned off before being milked. There is no liquid as easy tainted as milk, but when a cow is dripping with filth the milk cannot be clean. Women are accused a thousand times for making a bad quality of butter when the fault lies with the men; for a good quality of butter cannot be made out of dirty, tainted milk. Every farmer ought to have good, pure water in the first place, and good stables and the cows well cared for in the second; and, in the third place, a good cellar; and if he has those three things, and his cows are well fed, Winter and Summer, his butter will be of the best quality.

In order to have good, comfortable feather beds it is necessary to keep geese, and one of the greatest difficulties in raising geese is the choking of the goslings by the polly-wags; and though the women are often blamed for not taking proper care of them, in reality, the fault lies, again, with the men. For if the land was properly drained there would be no filthy pond holes, nor leaching water to harbor these polly-wags.

I received three Patent Rights: One for "Improvements for stabling Cows," granted on the 9th day of October, 1860; the second for an "Improved method of setting posts," granted on

the 14th day of September, 1861 ; and the third for "Improvement in hog-pens," granted on the 10th day of February, 1874. I thought at that time that I would procure engravings and have a book printed explaining these methods, but I have been unable to obtain the engravings, and I am now going to try and explain how the work ought to be done without them ; and I trust that the matter will be so fully explained as to render the aid of engravings unnecessary.

I have not commenced my Patent Rights in order to make one cent out of any man dishonestly. I have, however, seen that there was great need of improvement in these things. I have, while attempting to give the public the benefit of my knowledge upon these and other points, simply protected myself in order to secure a fair compensation therefor. By my methods, posts can be kept firm in all kinds of soil and climate, and cattle can be kept as neat and clean while stabled as while grazing in the open field ; and the swine can be kept clean and comfortable. In a few years two of these Patent Rights will become public property, but, at the same time, no person will have a right to explain in book, pamphlet or newspaper for the period of twenty-eight years, from the 19th day of February, 1874, any of the methods herein described.

Any farmer purchasing this pamphlet will be entitled to use the within Patent Rights upon his own farm, but no other.

*"Necessity is the beginning of Invention, God is the author of Ingenuity, and Agriculture is the Mother of all Arts."*

## S T A B L I N G .

**I**N regard to the stable. In the first place there should be two sleepers, about fourteen inches apart, laid lengthwise the stable underneath the middle of the first or lower floor. A trough or spout, made out of logs or planks should then be nailed in between these sleepers the whole length of the stable. The plank of the first or lower floor should then be laid from each side so as to project slightly over the edges of this trough or spout. One end of the trough or spout should be about three inches lower than the other, in order to carry the liquid off under the wall into a cistern or other receptacle, where it can be saved for future use. This spout should be covered with plank perforated with two inch holes, about two feet apart, to keep out frost and to allow the liquid to run into the spout. This plank should not be fastened down, but left so that a man or boy can remove it in order to clean out the spout when necessary. By running this spout into a vat or cistern the liquid can be saved and made of great benefit, for by mixing it with soil or ditching on other refuse land, it would make the best of top dressing and would enrich any kind of crop.

My invention consists in making the raised bed or floor upon which the cow lies moveable, by placing the same upon rollers, and in perforating this moveable floor, for the purpose of allowing urine, &c., to pass through it, instead of depending upon the inclination of the floor to carry off the liquids. I am thereby enabled to make the ground floor of the stable tight and solid to prevent cold air from entering through the floor to the injury of the cattle, and at the same time to conduct off the liquid from the cows bed, without allowing it to run over the surface of the same.

To enable those, skilled in the art, to fully understand my invention I will proceed to describe its construction and operation: The stable may be constructed in any suitable manner adapted to various requirements and circumstances, but the flooring of the stable should be solid and built so tight as to prevent the circulation of air through the same, this may be done in any desirable manner. The manger is made with slats in front, between two of which the cow's necks are secured while feeding. An inclined board prevents the cow from losing her feed by pushing it out of the way. This manger is built up from a solid impervious floor, through which neither air nor water will pass, with the bottom board of the manger raised some distance from the floor to admit under it the second or upper floor. This upper

floor is made up of two timbers running longitudinally and connected to two cross timbers, then these are supported upon four or more rollers. The perforations are made with a two inch auger. The end of this movable floor is passed under the floor of the manger and secured in a fixed state by a pin, which passes down through the lower timber that forms part of the front frame of manger. The part of the movable floor that projects under the manger has several holes bored through it, so that the floor may be drawn out or pushed further in and fixed by the pin according to the size of the cows. The next thing is, when the planks of the second floor is laid for the cows to stand on, they ought to be laid eight inches higher than the first floor. The groove behind the cows ought to be  $2\frac{1}{2}$  feet wide and 8 inches deep, and the walk behind the groove ought to be three feet wide and the same height as the second floor, where the cows stand. My plan is to have this second floor cut in sections wide enough for two cows to stand upon, each section acting independently of the rest. These sections being made into stalls, and two cows of the same size should be tied in each stall. If he wishes to do it, a man can tie up as many cows in a stable by this plan as if there were no stalls. You can tie each cow close to this partition, and one of them can be messed without being disturbed by the other. My plan is to let the short floor to rest on rollers, or scantling so as to run the upper or short floor under the manger and make it short or long according to the size of the cow, and this is the reason for having two cows in each stall. There are some people who prefer giving a fall or incline to the short floor where the cow stands and lies ; but this floor ought to be even. A cow always seems to have the fore-part of her body the lowest when she chooses her own bed in the field, and, that if her head is up hill her horns are an incumbrance. If preferred, a stake with an iron ring in can be used so as to tie the cow with a chain, either by the horns or neck. Milch cows, or young stock want a chance to twist their heads to lick themselves ; but cattle that are put up to be fattened for beef ought never be allowed to lick themselves, for, wherever they lick, the spot turns black. My reason for having the groove behind the cows so deep is this : If it was shallow the cow, in stepping back, would step into it and drag the manure over the floor ; besides, a farmer might be called away on urgent business and, perhaps, would not have time to clean his stables until the next day, but his cows would not suffer by this neglect. The short floor that the cows stand on ought also to be bored with a two inch auger in several places, to allow the liquids of the table to run into the spout in the under floor between the two sleepers mentioned in the first part. A man's own judgment will tell him that there is a great deal of difference in a cow going out dry and clean on a cold day, or going out wet, dirty and trembling with cold. This method which I have described will apply to horse stables as well as cow stables. When the stalls are made in the horse stable for each horse to stand on, there ought

to be two two-inch scantling under the short floor ; a notch ought to be cut in the scantling, that is, behind the horses, on the side that rests on the lower floor. The planks in the stall could be laid in halves, so that one half might be lifted up to allow of the under floor being cleaned out, should any dirt chance to gather there. I believe the floor would be just as strong by being fixed in this way. This would be but little trouble, as it would not be necessary to clean this under floor more than once or twice a year, and, by keeping the floor under the horses clean and dry, any one can see how much it would save, in a year, in the bedding of the horses, and how much labor would be saved in keeping the horses clean. I have seen light colored horses that had to be washed before they could be taken out of the stable. Hog-pens also ought to be fixed so as to be dry, I mean where a hog sleeps. I have seen cow stables that are fixed with blocks under the sills and the floor raised about two feet from the ground, and every chance for the frost to come up under the cows, and the stable could to be cleaned only by using an axe to chop up the manure. Of course, it stands to reason that cattle must suffer in such a stable. They will eat double the quantity of hay and provender, and come out poorer in the Spring than cows kept in a warm, improved stable. Cattle that are cold, wet and dirty cannot be kept without losing flesh. Every stable ought to be well underpinned and double boarded, and sixteen feet wide from the head of the cattle to the back wall of the stable. If the barns also were double boarded the hay would be much better preserved and more palatable for cattle and consequently last longer.

## P O S T S .

**I**N this I am going to explain how to set posts for fences in any soil or climate without being heaved out by frost, and also to keep them from rotting and decaying, for, I am convinced, they will keep sound many years longer set according to my plan than they will by being set the usual way. Some people think that if they set the posts deep enough so that the frost won't reach down to the bottom of them that they are safe ; but this is not so, it is the water that settles around the post and freezes that heaves them up in the Spring, and every time the post moves up the earth settles under the post, and this goes on year after year, until it tumbles altogether. I have seen people sharpening the bottoms of their posts, and when they would come up drive them down again. They put me greatly in mind of O'Finigan, when they knocked his eye out and then knocked it in again. Of course, when wood is wet one part of the year and dry the other part, it will soon decay. In my plan this difficulty is done away with, as I dig a drain where I am going to set the posts ; the loose soil to be thrown out on one side of the drain and the sods taken off from the top, if any, are to be saved, and when the sub-soil is reached to throw it out on the other side. When a man gets his drain dug deep enough there ought to be a gradual descent, so there would be no lodge in the drain. The drain must commence to be laid at the upper end, and follow the descent, and the man who lays the drain should have a hoe and shovel to keep the drain clear ahead of him as he proceeds. My plan of laying a drain is this: to stand a stone up on edge, at one side of the drain, and then to place a flat stone against it, in a sloping position, then the post should be cut according to the incline in the stone so that the post would be perpendicular. If flat stones are not convenient, cobble stones will do just as well by placing the small end downwards, and a flat stone can be placed under each post. In absence of the flat stone a piece of a board will do. It is plain that by having the thick end of the stone upwards it will form an arch for the water to run through ; then over this arch it should be well packed with small stones, or broken stones, they should be packed in such a manner that there would be no chance for any of the surface soil to work in between them. In laying the cobble stone, when there are no flat stone, on coming to where the post ought to be put there could be a stone laid on each side of the drain, and then a stone laid across on the top of

them and the posts set on that. Martin Doyle wrote a great deal about farming in Ireland, England and Scotland; he travelled also in France, and he says that clay soil has its failure, just as we have ourselves. In one place you will find a vein of sand and close to it a vein of gravel, and a man must understand draining perfectly to manage in such a case. It seems to me that Doyle never knew how to manage such a case himself, or he would explain it to his readers. It is true that very fine sand will work into a drain nearly where the water will come; if a man chances to come across any of those veins of fine sand in the course of his drain he must throw out considerable of the sand, and dig the place lower than the rest of the drain, then he must throw in some stones, then some sods of wild grass and lay those on the bottom of the drain, over the stones, with the grassy surface down, and when he is near the level the sod ought to have the green part up. If the vein of sand runs across the drain he must throw the sand out on each side and leave a space on each side to be filled up with sods in a like manner, at the bottom of the drain. These sods will admit the water, but no sand or gravel can ever work through. When the drain is finished and the posts set they can be made stationary with some stones, then these stones ought to be covered over with cedar bark, wild grass shavings or straw, whichever is nearest at hand. But care must be taken to have the small stones completely covered the whole length of the drain, and over this bark or straw, or whatever it may happen to be, put some of the top sods with the green side under and the loose soil may be put in, and care must be taken to fill the drain up with the surface soil until it will be level with the top of the ground. If there is any depth of sand in it the drain must be laid and covered, either in gravel or clay, before reaching the sand, and if this is done you have nothing to do but to set your post on something level and fill up the drain as described before—with the loose soil. Then the subsoil taken out from the bottom of the drain should be scattered over the top evenly. I have dug a great many open ditches and drains for covering both in England and Wales, and also in America, and I never yet saw the place where the subsoil was spread over the top but that place would give the best crop of any spot in the field, no matter what kind of soil the bottom of the drain might happen to be, any clay, that will dissolve, will enrich any soil that it is spread over, especially sand. There is no drain that ought to be left open at the upper end. At the lower end of every drain there should be a box constructed of two-inch plank, from three to six feet long, and wide and high enough to allow its being cleaned out with a hoe. This box should be cut through the top plank, about four inches from the end, to admit the grate. The sides and bottom of this box should be grooved inside to conduct and steady the grate. This grate should be made, the top and bottom pieces of heavy strap iron, at least half an inch wide, the bars of small rod iron or of coarse wire, set close

enough to prevent rats, mice, frogs or other such things from getting into the drain. The bottom bar of this grate should be wider than the top bar, so as to prevent its being pulled out entirely. This grate is set in so as to allow its being raised to clean out the mouth of the drain with a hoe when necessary, and to be kept in place in order to prevent the rats and mice and other vermin from furrowing into the sides of the drain, which, if they were allowed to do, would, in a few years, utterly destroy it. The groove in the bottom plank should be cut deep enough to allow the bottom bar of the grate to sink, the top of it on a level with the surface of the plank, and thus allow the sediment to pass by.

There should be a few furrows plowed each side of the fence after the drain is finished, and the posts are set and all done, it ought to be fixed off with a shovel and give the ground a descent from each side of the fence ; this will keep the posts from coming up or rotting, as there will be no water around them, and it will drain the land as well as secure the fence. Of course there are some clay farms that have no stone with which to lay drains. In this land, the drain ought to be dug down as deep as a man would want to set his posts, when he has dug down this far he can commence and dig one-half of his drain six inches lower than where he is going to rest his posts, then he can procure an instrument like the one used by carpenters for cleaning out four inch mortises. It should be turned up on each side, rounding so that a man could run it along this lower part of the drain and clear out a kind of a groove in the clay with it, as large as he would wish a runway for the water, then cut green, tough sods and lay them across this groove with the green side down, or timber could be made to serve instead of sods, and the timber would never sink down in this narrow groove and the water would have plenty of room to run. The English farmers think that the sod of wild grass will last as long as tile. There are bogs about fifteen miles from Liverpool called Rainfairth Mosses. They cut the turf in this bog, and the farmers buy it for draining purposes. It is very soft when first cut : they dry it like bricks, and when it is dry they lay their drains with it. Now, when this ditch, which I have described, is filled in there should not be any clay put into it. People that are used to draining and know the benefit of it always drain their land when they break up their greensward, so they can fill their drain with the surface soil, for if clay or loam is put in it will hold the surface waters and not allow it to leach through ; besides, there are some clays that will dissolve like lime, and if there is the least hole it will find its way into the bottom of the drain. This, any man can see when he is walking along the road. If there is one inch of a fall in the clay, it will crumble and fall away like slack lime. If the stuff is put in as I have given directions the waters will leach through and the drain will discharge clear water. The outlet of every drain should always be kept clear so as to allow a full passage of water out of it.

## STONE FENCES.

I have seen a great many stone fences made through the country, yet never saw a stone fence built out of round stone on any kind of good soil that became wet but what the stone wall or fence would tumble down. The end of the stones, towards the middle of the fence, always sink downwards, and then the fence gives out from the bottom. I cut a deep drain, then laid a stone wall, I had to cut part of this drain seven feet deep, where there were rising ground, or knolls, but I did not have to dig much of it that depth. I had to dig part of it this depth in consequence of some low land that was above, in order to drain it and to allow the drawing of drains from other parts of the field where the land was lower, and to have the water emptied out of these side drains into this drain and ran under where I intended to have the fence. I laid this drain as I have explained in my plan of setting posts, with stones laid up again the side of the drain and a flat stone leaned up against it in a sloping position. I laid the drain all the way through in this manner. I filled the drain level with the ground with stones and I built my stone fence on top of this.

In 1859 I hired out my place, and the man that rented it had a great haying bee. He had something like fifty or sixty men. They examined the drain that I had laid under the stone wall and they all said it could never be improved by any man. I thought so myself at that time, but, after all, there was a failure in it. When the frost came in the winter and froze the sides and then thawed out in the spring the sides crumbled and worked through into the bottom of the drain and choked it. If I had covered my drain when I laid it first and filled it in with bark or straw and surface soil, as I explained in my plan of setting posts, the drain would have remained clear. It need not be filled with soil any more than a foot or eighteen inches, but care must be taken to always put in loose soil, and after that the stones until on a level with the surface of the ground, then take a line and lay the foundation of the wall. The middle of this wall should be packed well with stone, that is put in the outside courses of this fence should be well supported at the inner end with small stones, so as to keep them from drooping in. If a man commences a wall in this way and builds but one foot high the first year, he can build it according as he plows his land picks off the stones, and by doing this he will have a place to draw the stones, which are a

great deal better than putting them up in heaps. If a stone fence is managed in this way there will be no failure in it, and the land will be drained at the same time. If the stones are good building stones, so much the better, for it will then be a very easy matter to build a handsome fence over such a place as this, and it will never cave out nor in. It would not be advisable to bring many cross drains into the drain under the stone fence, because the old saying is that "the constant drop wears the stone," and it is better to bring the water into different drains than to bring too much water into one. The work would be safer.

## HAYING.

I read in one of the agricultural papers where the leading men of one of the agricultural societies went to view a farm. The farmer told them that he never stood on either his hay mow or hay stacks while gathering in his hay crop. I never could see how that man built his haystacks without having some one on top to lay the hay properly. Perhaps he used a balloon. What would that farmer say were he to see a horse on the top of a stack, tramping the hay, and yet this is no uncommon thing in England. The horse is raised on to the stack by a derrick or block and tackle, similar to the way in which material is raised to the top of a building. The horse is blindfolded in some manner to prevent his becoming dizzy when the stack gets too high. I have seen stacks, near London, on top of which many men were employed to receive the hay as unloaded, spread it around evenly and to assist the horse in tramping it down. Some of these farmers would have three or four teams unloading at the same time. In this way it is claimed that the stack is built firmer and better, for if the hay was unloaded all on one side of the stack it would give out on the opposite side, the hay being packed harder on the side that received the hay than on the other. In order to have a stack stand firm the hay should be unloaded at each side. In this country people prefer green hay to any other. But in the Liverpool markets you could not sell a load of green hay in a twelve month. They would not buy green hay. When there is any sap in the hay it sweats and turns a brownish color. When hay is brown without being musty it is in the best condition. The manner in which they manage to keep their hay clear from must is, they make use of a tube or pipe about three feet high and the same in diameter, furnished with two handles near the top. When they commence to fill the mow or build the stack this tube is set in the middle of the space and the hay is built up around it. When the hay is even with the top of this tube it is raised up by means of these handles and the hay is built up around it again. This leaves a shaft running from the top of the stack to the bottom, into which the bad gases and foul air will gather and be conducted off, leaving the hay to cure without becoming musty or foul. A farmer of judgment can easily tell whether more of these shafts are wanting, and how many according to the size of the stack or mow. Musty hay is acknowledged to be the greatest cause of

heaves in horses wherever it is fed. Hay should always be cut in the sap.

There are men who, at our Agricultural meetings, talk, whether they know anything or not, and I read of one of these who said, he would as soon believe that a lizard would turn into a bird and fly to the top of a tree, as to believe that chess or darnel would grow where it was not sown ; but chess will grow where it has not been sown. A piece of fallow ground, part of which was high ground, and part covered with pond-holes, was sown to winter wheat. On the high ground the crop was good, sound grain, and in and around these pond holes it was heavily mixed with chess. The wheat used was perfectly clean, and the ground had never been seeded before. How then did this chess spring up. My opinion is that chess will grow wherever the land is not properly drained.

## FIELD DRAINING.

WHEN a farmer is commencing to drain a field, the first thing to be done is, to dig a deep ditch at the lower end of the field, this ditch should be dug some inches deeper than he calculates to have his main drain. After this ditch is finished, the main drain is cut from this ditch to the upper end of the field. People often make a great mistake by bringing too much water into one drain. To avoid this, people ought to cut several parallel main drains. This would enable the water to be divided more equally. Then there should be a head drain, cut along the upper end of the field, then there should be cross drains to carry the water into those main drains, the fall from those cross drains; until the main drains should be gradual, an inch or two is fall enough. Some people bring the cross drains into the main drain at both sides directly opposite one another; but it is a better plan not to bring them in exactly opposite. My reason for this is the land on one side of the main drain, might be very springy which would occasion a greater flow of water and choke the mouth of the drain opposite. As a general thing, people, dig all the drains in in a field, before they commence laying any of them. It is often the case that there are sag holes, at the foot of a hill, where the water springs up, some people cut their head drains under these sag holes, by doing this, these sag holes can never be properly drained. The head drain ought to be cut above these sag holes along the top of the field. If the main drain or any of the cross drains come across those soft places, the drain should be dug some two or three feet deeper and filled with stones packed down close until they come nearly level with the bottom of the drain, then get sods of wild grass which is easily procured in such a place as this, lay those sods on top of the stones with the grass side down and when it is just level with the rest of the drain; lay the last sods with the grass side up, then you can lay it either with tile or stone across, let it be remembered when a man is digging his drain, to throw the loose soil on one side and the sub-soil on the other. Where I have helped to drain in England, they generally do their draining just after ploughing up the green-sward in the field they intended to drain. The first drain they lay, is the drain at the upper end of field, when that is laid they commence to lay the main drain down towards the bottom. When a man is laying a drain he should have a hoe and shovel and keep his drain perfectly clean as he goes along. I have heard a great many people say that the

surest way to lay a drain is to lay a stone up against the side of the drain if it is six inches thick it will be thick enough then get a flat stone and let one end of it rest on the stone which is laid against the side of the drain and let the other end come in contact with the other side of the drain in a standing position and then fill those up level with small or broken stones and a man must make sure and secure his drain with plenty of small stone, over this so as not allow any of the surface soil, working down into his drain. When a man does go to the expense of draining, it should be done right, or not at all. I have seen people breaking stones for drains as they break them for macadamized roads, and filling up the drain with these a foot or fifteen inches in depth, I have also seen people drawing cinders from a blast furnace and filling the drains with them, if there is no flat stone, round stone could be used instead, by placing them in the bottom of the drain with the small end down, but there should be enough broken for to fill the drain to the depth of five or six inches, this would save a great deal of labor, not having to break all the stones for the bottom of the drain, as these round stones take up a good depth of the drain, and the drain in my opinion would be better laid in this manner, because there is more chance for the water to run between those stones, then if they were broken a man ought to have his cedar bark, shavings, wild grass or straw, which ever it may be, and cover his drain as he goes along to prevent any sediment from the top getting into his drain, the next thing to be done is to lay sods with the grass side down, on top of this straw, bark or shavings. If it is green-sward, just after being ploughed and sods are conveniently plenty, drains might be filled with them to a level with the surface of the ground; if not, fill in with the loose surface soil, and then spread subsoil evenly over the field.—Do not use any of the heavy subsoil to fill up the drain, for if this should be put in it would hold the surface water, as well as ever, and not allow it to sink into the drain. I have seen surface water turning corn, wheat and other crops yellow and retarding its growth after a heavy fall of rain. It would be well to remember that the farmer ought to measure the distance between his cross drains. They do in England, in most cases, for, when a farmer walks along the foot of his field, he will see if the main drains are in good working order, or not, and, if he sees a failure in any of them he can take his spade, and not vary six inches from where he ought to dig and will soon find out the failure, and where it is. If a man is laying a drain in clay land when he has his main drains cut, and his cross drains also, he can get an instrument made in the shape of a gouge that a carpenter uses to dress out mortises with, he can have this turned up at the handle and the handle should be about four or five and a-half feet long, so a man can use it conveniently, and he can cut a groove in the bottom of the drain about three and one-half or four inches wide wide and the same in depth, then cover over the top of this, with wild grass or split cedar, if there is any convenient. I once saw a

drain in the bottom of a clay cellar, the bottom of which was grooved out in the form of a V, narrow at the bottom and wider at the top, and this groove was covered with thin bark. It had lasted 30 years. If a man is draining in sand with a clay bottom, just as soon as he reaches the clay he ought to dig deep enough in this clay to lay his drain without laying it in the sand. There is always plenty grass where draining is needed, and if a man meets with any veins of sand in his draining he should be careful to stop them with sods of wild grass. This will allow the water to come through, but not the sand. If any of the surface soil works from the top into the drain it is soon choked up. It is a poor soil that does not form a turf sod when it is greensward, and sods is the kind of stuff a drain should be filled up with, if possible. If the drains are managed as I have described, when a plowman goes to plow he will lay his lands in such a manner that the water will follow the plow, and, as soon as it comes to these cross drains it will disappear and go into the main drains and the main drains discharge clear water, and that is a great deal better than to have the best of the surface soil carried away by the water into ponds, rivers, ditches, or along roadsides. I heard a man in Brasher say that draining was of no benefit to clay land. He said that if he were to dig a hole  $2\frac{1}{2}$  feet deep, fill it with water, and then dig another near it leaving it empty, the water would not run from one hole to the other. Now, I will leave the question to any man who may chance to read this, if this hole would come in proximity with or over one of these main drains which I have described, would not the water be speedily carried off. Another man says he can drain with sand in clay land, but both of these men labor under a mistaken idea, and would lead other people astray if they knew no better than to attempt to be guided by such suggestions. I have seen sand so fine that water would drain through very slowly, and I am of the opinion that it would not drain through at all. To remedy this I have seen people go into a gravel pit and taking a screen made of edgings, and throwing the gravel against it so as to separate the sand from the gravel. They take particular care not to have any sand among the gravel, then they will draw and fill the drain with this gravel to the depth of twelve or fifteen inches, and then cover with the surface soil as before. If fine sand were allowed to remain in the gravel the action of water would tend to collect in some one spot, and thus choke the drain and make it a failure. No grain whatever will start to grow until such time as the right heat is in the ground, and on any clay or good soil that is covered with water in the Spring, and retains it until the sun dries it up, instead of growing to its natural growth; it becomes shrivelled and dry, where, if the land, instead of being covered with water and kept cold all Spring, had been dry and mellow, the crop would have an early start before the drouth of Summer could have affected it. As soon as the crop covers the ground it draws moisture from the subsoil. One acre of land worked and taken care of properly is

worth five acres but half worked. If a man should throw his coat on the ground, the warmest day in Summer, when the dust is flying in every direction, when he comes to take it up in the evening he will find the ground under the coat moist. There is no drain that is open but should be secured at the open end in this manner, which I mentioned in another part of this work, to keep out rats, mice, and all other things which might work up into the drain and injure it.

## WELLS.

THERE is nothing more important or requisite in the making of butter than good, pure, wholesome water, and perhaps there is nothing so little understood as the proper management of wells. There is living at Brasher, St. Lawrence County, in this State, a pump maker by the name of Hall. His agent sold a pump to a farmer residing in the same town, the farmer giving in payment his note, payable some time in the future. Before the note came due the farmer sued J. Hall for damages, because, as he said, the pump spoiled the water in his well. There was a jury on the case and one witness swore that he drank of the water before the pump was put in the well and that it was good ; he swore, also, that he drank of the water after the pump was put in, and it was not fit either for man or beast to drink. Then the pump was pulled out and he swore that he drank the water afterwards and it was good, and he also declared that the pump spoiled the water. The jury disagreed, and each party had to pay their own cost. These same jurymen were well informed, but neither the jury, lawyers, or the justice could tell where the failure really was. The Justice was Mr. Edgeton, of Brasher, and he is spoken of by everyone as an upright, honest man. The pump was made out of tamarac, and the gum that exudes from the tamarac is considered wholesome to chew, but is used also as a medicine. No man, of course, has any suspicion that the witness perjured himself, because he believed it was right, and, as far as he could see, it was the pump that spoiled the water. I procured a copy of the minutes of the trial from Mr. Edgeton at that time, and they are now in my possession. I believed that, instead of the pump spoiling the water the water spoiled the pump. When a man has decided to dig a well he generally chooses the driest season of the year. As he digs down the soil changes from one kind to another, and there is not a change of soil but that there is a runway for water between the different soils, no matter if he were to dig down fifty feet. After the well is finished these runways continue to run in the same manner as the well was dug, except when the water in the well is low ; then only those that are lower than the surface of the water will continue to run, and as the water in the well rises they all resume their flow. Of course, the surface water is the first vein of water met with in digging a well, yet it is very seldom that this runway is running when he is digging the well. It is only after a heavy rain and the ground is saturated with

water that the surface veins are in running order. There are many things that go to render wells and springs impure and unwholesome, such as dead animals and carrion of all kinds which are allowed to lie and rot on the ground or in the ground, hog-pens, stables and privys, the substance of which is absorbed by the surface water, while the ground is saturated after a heavy rain, and in the course of events is carried by this surface vein, running into the well. When the well was low, before this rain, all the foul gases and sediment settled in the bottom of the well, and as quick as the water raises in the well it takes its course in these runways as it did before the well was dug; and while this water is taken up with a pail or bucket it tastes well enough, although the foul gas and sediment are yet in the bottom of the well. But as quick as a pump is put into this well the gas and sediment in the bottom spoils both the pump and the water. It is about 14 years since this law-suit took place to which I referred, and it has been argued and talked about by a great many people since, and I never heard any two that could agree or come to any satisfactory explanation as to the reason why the water should be good before the pump was put in, and bad while it was in the well. And this is not the only well. There are thousands all over the country in the same situation. Now, it is no difference where a man digs his well if he knows anything about it, he can secure his well in such a way that he will have good water. After the well is finished he should dig a drain around the well, and he must be sure not to lay it in the surface soil but in the first gravel or hard pan he comes to. If that is done and covered as I have heretofore described and have it meet around the well, and then run it from the well in order to draw the surface water away. In making the platform over the well he should have it project over the drain, so that every drop of water, or anything which may be spilled around the well be carried off in this drain. It is plain to anyone that no filth or dirt can get into the well by following this plan. There is no land in the world but has different kinds of gas, and when a well is first dug these gases settle in the bottom, hence a pump should not be put in such a well for at least five or six weeks after being dug, and even then the well should be pumped dry and well cleaned out, and they should be cleaned two or three times at the first. Some people aver that when a platform is made over a well and the pump put in, that there is no circulation of air to and from the well, and that without this the water is apt to become foul. To remedy this evil a hole can be cut in the platform, twelve by eighteen inches, over which a box, made for the occasion out of inch boards, a foot or more <sup>in</sup> height, can be set. This box or crib should be perforated at the sides and ends to within four inches of the platform, the perforations being made with an inch auger. This box should cover the platform so as to prevent accidents, or leaves and dirt from getting into the well. This would allow the air to circulate freely. There is no drink so welcome to the thirsty as a drink of good pure

water, and unless the wells are kept clean it will be impossible to assure it at all times. If the wells are fixed and managed as I have described people will have fewer foul wells, and the quality of butter will be greatly improved.

I read an account in 1859, in the Albany *Weekly Journal*, of two men that engaged to clean out a well. One of them became disengaged and refused to go down, but the other man went down and in fifteen minutes he was buried beneath thirty-two feet of debris, the well having caved in. This sad accident, though shocking, is not the only one on record. I have never, since that time, noticed any statement made as to where the failure in that well existed. When a man sets out to dig a well let him dig it seven feet in diameter. That leaves two feet all around for the wall and three feet for the inside of the well. The stones being set, thus wedging will prevent the well from caving inwards. To prevent caving outwards the space behind the well should be well packed with small stones or gravel, and this should be done as the well is being built. With a well built in this manner it is out of the question that a stone should give way. The well in question was dug, for the most part, through a strata of sand, and perhaps in a very dry time and the well was very improperly stayed at the back. When the rains came the surface water carried the sand with it. This continued until the support at the back gave way, allowing the stones to become loose, and the consequence was that the well caved in and the man lost his life. If, in digging a well, a man should come across such a vein of sand the wall should be braced so as to bind both inwards and outwards as far as the sand extends. As sand will come in at most points where water will, he should proceed as laid down in Field Draining, by procuring sods of wild grass, and place them between the wall and the sand. These sods will not spoil the water, but will allow it to run into the well without carrying the sand with it. Some people imagine that clay will do as well as sods, but this is a mistake. Most clay will dissolve like lime and be carried into the well as sand. Moss filled in the interstices of the stone will also help to keep sand from running in. It is to be hoped that men will be more careful in constructing their wells so that no such accident as this should again happen, as this poor man was caught in a worse place than they at Bull's Run, for they could and did run away, while he, poor fellow, could not.

## T R E E S .

I noticed in the *Weekly Sun* of March 25th, 1874, some remarks about the usefulness and value of trees. The writer recommended that they be set out along the roadside as a preventative against winds and storms, and with him I fully agree. Were you to stand on the top of a hill in England and make a survey of the surrounding country, you would imagine that it was nearly all woodland, yet an inspection of these farms would reveal the fact that no necessary land was taken up by trees. They are set out along the roadsides and all the fences on the farms, and they add not only to the liability from damage to the crops by storm or wind, but to the beauty of the scenery, and are a source of comfort, not only to the farmer but to his cattle as well. In Hildon Parish, Buckinghamshire, Eng., the workingmen boast that within no other two miles square in England can as much live oak be found. It is no trouble to load either hay or grain in these fields, and the comfortable shade in the heat of the day, a luxury unknown to many, very many of the cattle upon our open fields and prairies. The writer in the *Sun* goes on to say that there is no better way to combine utility with profit than by planting these trees. They draw fully one-half of their sustenance from the roadside, and by a little good management may be made to draw the most therefrom. It would seem that, from these remarks, some are afraid that if these trees were planted and allowed to grow they would rob the plow-field of some of its strength, and so they would unless care was taken to prevent their roots from striking out into the field. The roots of large trees will run out a long ways if allowed to grow, and perchance in soil that would otherwise produce excellent crops of whatever was sown; since the trees were planted and their roots had taken possession of the ground, would produce but inferior crops.

I had the following inserted in the St. Lawrence County papers some years ago :

"On my way to an Agricultural Fair, I saw a man at war with a Balm of Gilead tree, the roots of which had taken possession of his cabbage garden. It had taken stronger possession than ever Napoleon did of the soil of Austria. This man would remind you of the Irishman who went to cut fat pine that had been buried eighteen feet beneath the bogs of Allan, in Ireland, ever since the days of Noah's flood. I asked him why he did not take the precaution to ~~want~~ the root of the tree out before he began to cut it down when he

planted it." He said it was impossible for a person to do this unless he would cut the roots with an axe. Now, if anybody knows how to do it, it is no trouble at all.

[Signed] PATRICK BURKE."

If a man says he can do a thing and then cannot, he should be set down as an imposter. After the trees are planted along the fences it is but little expense or trouble to plow a trench between the trees and the adjoining fields, then get a spade or shovel and square out the bottom of this trench to the depth he requires; the most of the dirt should be thrown up against the fence and around the trees. If it is fixed as it should be it could be mown as well as any other part of the field. It is plain to any man that the roots of these trees will run along the fence, but never cross this trench. If they come to the edge of the trench they will turn up, but never cross it or take root on the opposite side. I care not if the trench was only a foot wide. The roots of these trees growing along the fence will bind in one with another, all along the fence. The most dangerous time for trees to be blown down is in the Spring when the frost is leaving the ground, and it is plain that those trees having their roots entwined have more power to resist the high winds than when standing separate. They should be planted far enough apart to allow apple trees to be set out between them, and by having this trench dug and kept clean there should be but little dampness among the roots of the trees. It is not natural for an apple tree to do well in wet soil. A man could rise up in the morning, and travel until sundown in Warwickshire, Gloucestershire or Oxfordshire, in England, and you could see nothing in the field because of trees along the fences, until you come to a gate. After harvest they gather all the apples and bring them to the mill and make cider of them, and it is no uncommon thing for a farmer to have 1,000 barrels of cider in his cellar. The cat said when it eat the bagpiper that it was both meat and music, and a man that would drink a gill of this cider would say that it was both meat and drink.

## TRENCHING AND SUBSOILING.

I HAVE read in some of the Agricultural papers, that in trenching a garden a person should avoid bringing the subsoil to the top. It is my opinion that the writer thereof never did subsoil a garden and that he knew nothing about the subject in any way. When a garden is beginning to grow foul it should be trenched and subsoiled. The first thing to do is to take a strip the full width of the garden and two and a half feet wide, then take the upper half of this and place it in a pile by itself ; then remove the lower half, putting it in a separate pile. This trench should be about two feet deep. Now your trench is clear to begin with. Take another strip the same width and cut it as deep as you think there is any foul stuff, throwing it into the first trench until within two or three inches of the top. Manure should have been drawn on the ground beforehand, and when you have raised your first trench as high as just spoken of, spread some of the manure on and fill the remainder of the trench with the subsoil of the second. Your second trench is now clear for commencing work upon the third. Continue on working one trench after another until you come to the last trench, and then what was taken up first out of the first trench should be put in the bottom of the last trench, and then the subsoil from the first trench should be put in to raise it the right height for the manure. By doing this it will enable the manure to be near enough to the surface, so that any crop which may be put in can have the benefit of it. I have heard people say that any weed which is buried nine inches and the manure on top, as I have described, will never grow.

## CELLARS.

THERE are few farmers that are fortunate enough to have a building site so that there is a fall for the water from each side. The most of them have their houses built so that one part of their cellar is four or five feet deeper than the surface on the other, this causes the dampness from the surface of the soil to come to the cellar wall and keep it wet continually. Some of them lay their cellar walls without lime or plaster of any kind for about four feet high, then they lay it with mortar for the remainder. When they commence they lay the bottom of the wall with the largest stones they have ; then, when they lay their drains from the cellar, they have the mouth of the drain open, so that rats and mice can come up the drain into the cellar. Beginning the wall in this way, leaves holes between those large stones so that the rats and mice get under the wall and make runways for themselves, and work along until they get up on top of the ground. Very often a man will lose all of his potatoes on account of these runways by the frost getting into the cellar through these runways ; yet, perhaps, the farmer would not be aware of the way in which the frost came into his cellar ; often the rats and mice destroy a drain so as to occasion back water, making the cellar damp and foul. I don't care how careful or industrious a house-keeper is, she can not have pure milk and nice fresh butter in such a damp, foul cellar. Now, to save all this trouble, it would be but little more expense to dig the cellar eighteen inches larger all around than it is intended to build the cellar wall. A drain should be laid all around the outside of where the wall is to be laid. Then, when at the place where the drain leading from the cellar commences it should be dug a little lower than the other ; then the top of this drain should be covered with large flat stones. A cellar wall, to be right, should be laid in mortar from the foundation. When this drain is laid great care should be taken to prevent the surface soil from working through, it should be packed well with small stones after being laid, and if there are none at hand small enough, they should be broken. Then cover them over carefully with cedar bark, shavings, straw or wild hay, and cover this with sods of wild grass, with the grass side turned downwards ; and after the cellar wall is built, if it could be got at, the remainder of the drain should be filled, level with the surface, with black muck. It would not take much, and there is but very few farmers but lack muck on their farms.

It is plain to anyone that whatever water comes from the upper land will be taken away in this drain, instead of keeping the cellar damp and foul, and it also keeps the cellar wall from giving away. I have known of buildings falling on account of the bad foundation. Some people lay it to the masons when it is not their fault at all. For I have seen every course of stones bound in the middle, and yet the wall gave way. When the cellar drain is laid, if there is much of a fall from the cellar, it need not be laid any further than it can be covered well. It is no difference whether the drain is laid with stone or tile. The mouth of the drain should be protected by box and grate as described in Field Draining to keep out rats, mice and other vermin. By having the drain thus protected no water will remain in it to freeze, and form a nucleus for frost in the cellar. People that have wet cellars now, the best way for them to do is to dig a drain all around, within one foot of the cellar wall, until it is brought out to the drain which goes from the cellar, and it should be low enough so that it can be laid even with the cellar floor and then cover it as I described before. This drain must be dug all around the cellar within one foot of the cellar wall, inside the cellar; when this drain is filled up level with the cellar floor and covered he should, if flags are not at hand, break up stones and fill in this foot of space between the cellar drain and the wall. If this was done and a rat should get in through the cellar door or windows it could never work in under the cellar wall. When the cellar is damp every drop of milk that falls on the floor causes a foul smell. A farmer should have a separate cellar for his milk and butter; they should never be kept in a cellar with pork, fish, potatoes, and such like stuff. I have seen cellars, that if a tub of butter was to be kept in it two or three weeks, let it be ever so fresh and sweet when placed there, it would taste old. There should be plenty of good, pure air in a cellar where milk and butter are kept. To have the cream rise well and to keep the butter sweet and fresh the windows can be fixed on the outside so as to exclude the rays of the sun from the cellar. It is not a good plan to have too much light. A twilight is allowed to be the best for a milk cellar. This light could be produced by shading the cellar windows in such a manner as to obtain air and but little light. The English people do not have as low places for their milk as we have, for their Summers are not as warm as ours. I never saw a place for milk in England but that the floor was laid either with flags or flat stones, made for the purpose. They sprinkle their cellar floors with cold water and mop it out just as regular as any room in their house. As for their butter, they do not tub it and keep it as we do here, for what they churn one day the day following they take to market. I do not think it should be considered very expensive to lay a cellar floor with tile if it makes the cellar any better, and I think the majority will agree that it is better than a clay bottom, if it be only to enable a person to mop it out and keep the cellar clean and fresh.

## KAIL, AND THE HANDLING OF MANURE.

THERE are thousands of people employed annually picking kail or wild mustard out of wheat, oats and other crops. I have heard farmers say that they would give hundreds of dollars to be rid of it. I believe it never can be done away with in the fields. It must be killed in the barnyard. First, there is no farmer that has kail in his land but should clear out a space in his barnyard, and then pile up all the manure in a heap on this clear spot, mixing cow manure, horse manure, and all kinds of litter and straw together. He should be careful to clean about his barn door, where the threshing is done, and the barnyard; it also should be thoroughly scraped and cleaned out with a hoe, and all the stuff that is scraped up should be put into this heap of manure. Care should be taken not to put it on the outside of the heap, but into the middle of it. When the manure is all thrown together water should be thrown on the heap. Then it will ferment, and after it heats and ferments none of the seeds which were in this heap of manure will grow. If it rots or steams too fast water should be put on to keep it from steaming, as the steam takes the strength out of the manure. Some farmers scrape up all the slush in the barnyard and throw it around on the outside of the heap of manure, and then smooth it off with the back of a spade or shovel, this should not be done because it prevents the air from mixing with the manure and it will not rot, unless it comes in contact with the air. I have heard many farmers say that it is better to keep the manure under shelter, that they could tell by it smelling so strong, and at the same time the strength of the manure is steaming away. I defy any man to mention an instance where he has ever noticed any noxious weed growing out of a large heap of manure. Some people will leave manure in for a year, thinking that by so doing they will stop the weeds from growing, but at the same time the manure is not much better than good soil. I have seen horse manure that had been kept under cover and it was so white that it was valueless, because the strength had all steamed out of it. Some will say that it is some work to pile up the manure and fix it as I have described, it is some work, true enough, but it is work that will pay. It is true that God gives us the means of making a living, but it is true, also, that we should work for it in the best way we know how. Our climate is cold here, and when we throw out the manure it is mixed with frost and snow, and if it is it will not

lose any of its strength until the Spring of the year. If it is managed as I have described, two years manure is better than three years, when allowed to rot over a year. There is not a county from Liverpool to London, Eng., but I have been in, and worked for farmers. I lived there for twenty-one years, and those farmers never had any fear of their manure spoiling in the winter. They managed the manure as I have described. Their weather is warmer in winter than ours. Now, our small farmers in this country are unwilling to Summer-fallow any of their land for fear of losing a year's crop from the piece of land which should be plowed. If they would plow it early in the Spring and then drag it and before it went to seed, buckwheat could be sown. If the farmer should object to buckwheat it could be sown to corn. If buckwheat should be sown after the crop was harvested and taken from the field, the grown should be dragged directly, and then the seed of the buckwheat remaining in the ground would grow and the Winter frost would kill it, and by that means the buckwheat would be exterminated, and the kail, also, remaining in the ground would spring up and be killed by the frost. If sown to corn there is the same need of dragging. I have known farmers that bought very little hay, and that very little contained seed enough of the white daisy, so that their pastures and meadows are covered with it now. If the manure had been managed as I have described it would put a stop to all this damage.

THE END.

## HOG-PENS.

**H**OW to build a hog-pen to prevent the hogs from freezing to death in winter; to prevent their death being caused by the filth and steam in summer; and to prevent the sow from crushing her young against the wall when she lies down.

In building a new hog-pen, the sleepers should be laid crosswise the building, the two sleepers nearest the center being laid about twelve or fourteen inches apart, in order to place a spout between them, similar to that described in the "Stabling of Cattle;" the other sleepers being laid at regular distances as in other floors.—

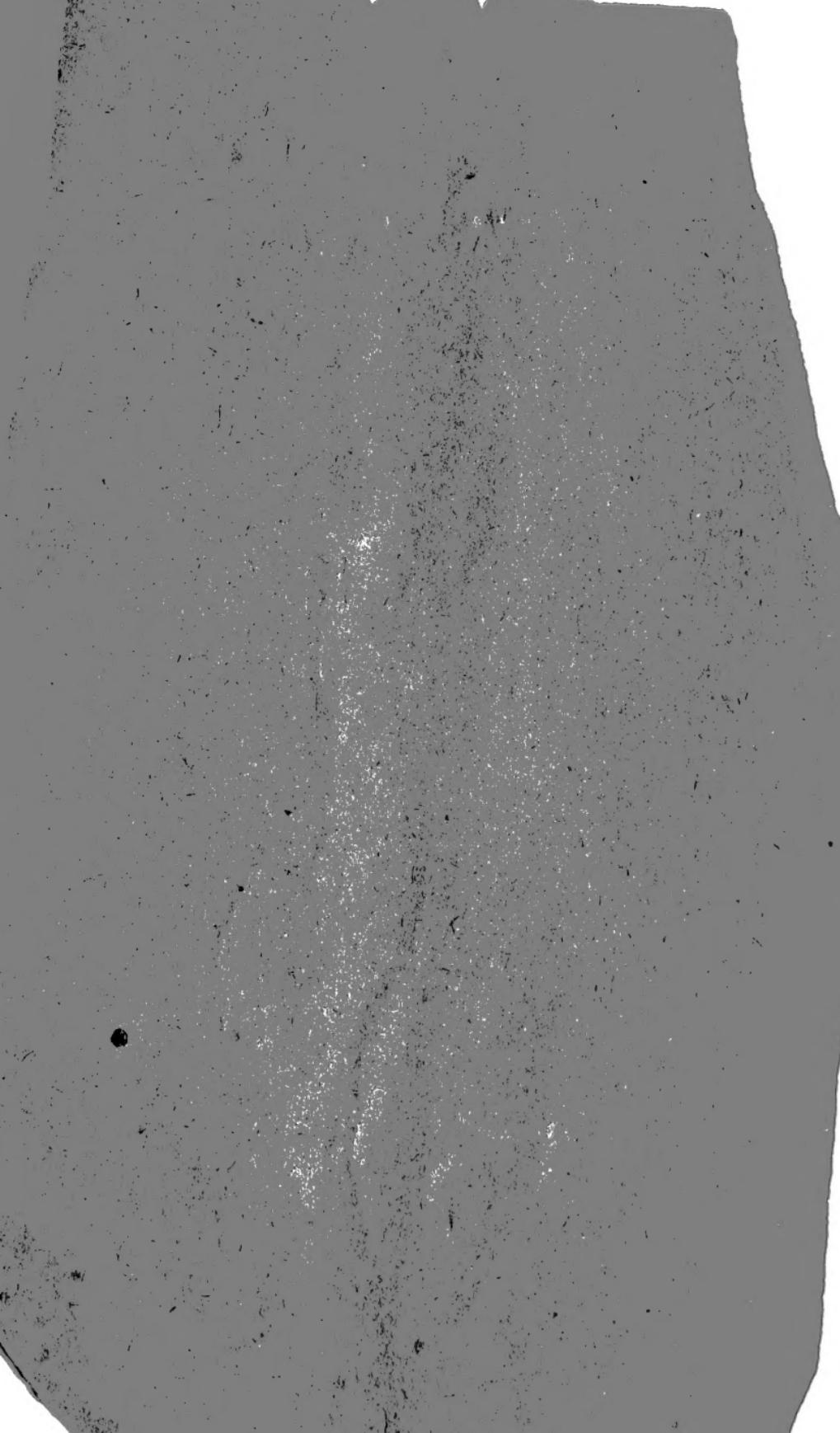
The floor should slant slightly towards the center in order to carry the liquid into the spout. It should be perfectly tight to keep out the cold. A second floor should be laid over this; this floor should be set on four inch scantling, the scantling laid lengthwise the pen. The boards or planks should be narrow, and not laid tight; but so as to allow the liquid to pass through to the lower floor. The plank that covers the spout should be fastened with hinges to allow being lifted when it becomes necessary to clean the spout. But if you do not wish to save the liquid, the under floor is not needed, but a drain should be dug underneath the foundation, the same as for cellars, to carry off the liquid and prevent its becoming stagnant under the pen. If the under floor is done away with, the second floor in the sleeping apartment should be made perfectly tight, and the floor in the eating apartment should be made as described for the upper floor, and in fact but one floor is absolutely necessary, as experience proves that the floor in this apartment is always dry and that the wet and filth gather in the eating room. A partition should be run across the pen, about one third of the distance from one end, in order to provide a separate sleeping apartment for the hogs. It should be furnished with two doors opening in opposite directions. In putting up the partition and setting the doors a 2 x 4 scantling should be laid along the floor, flat side down, and a second fixed as high as you want your partition. (the partition need not be as high as the ceiling unless desired.) Your door frames should be made of 2 x 4 scantling— or heavier if desired—the side post running from the floor to the upper scantling. In setting up the frames, the foot should be placed one side of the bottom scantling, and the top on the opposite side of the upper scantling. This will give the door sufficient incline to shut to of its own weight, and the hog can easily open it by pushing agai

**ADDENDUM.**

it. Remember, however, that the door for entering the sleeping apartment should slant in an opposite direction to that by which the animal goes out into the eating room. Now case your door frames with inch stuff, hang them on hooks ; to insure strength, these hooks should be long enough to pass through frame and casements, and to receive a nut on the opposite side. By having them open, one in each direction, it gives the hogs a chance to pass from one apartment to another at will. The frames should be made and the doors hung before being fastened up. A two-inch plank, 6 or 8 inches high, should be set into the door frames to allow the door to shut against, and to prevent their clogging with the sediment. To prevent the possibility of the doors opening so far as to remain open or swing back against the partition, they should be set one at each end of the partition in such manner that they will swing up against the wall. This plank should be set in such a manner that it can be taken out at such times as the sow may be heavy with pigs, or in lieu thereof, a slanting platform may be placed on each side of the door in order to allow her to step over the plank without injuring herself. To make it warm the wall of the sleeping room should be bricked up with soft brick to the height of four or five feet. It should be boarded up again inside the brick. If the brick is not at hand saw-dust, tan-bark, or a coarse cement placed between the two tiers of boards will answer the purpose ; or tar-paper may be used in the usual manner.

To prevent the sow from crushing her young against the wall, slats two inches wide and two and a half feet long, cut from a two inch plank should be placed all around the sleeping apartment, except where the doors come, twelve or fifteen inches apart. The feet of these slats should be placed about eighteen inches from the wall, the tops should rest against the wall. They should be firmly nailed to their place. The top of the sleeping apartment should be air and water tight and furnished with ventilators that the temperature may be regulated as necessity required.

Old pens can be easily altered to suit the plan for the new.





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## RECOMMENDATIONS.

THE following recommendations have been given Mr. BURKE in favor of his "Improvement in Hog-pens," the patent upon which he now holds, and which is described in the within pages:

—o—

Stephen Daily, of Brasher, says:—

"I believe it is the best plan of a pen I ever saw, both keeping the bed free from wet and dampness, and the pen so warm during the cold weather that there is no danger of the little pigs freezing to death in the winter. The sleeping division is so arranged as to prevent the sow from crushing the little pigs. Finally, I believe it worthy the attention of all farmers, and would ask that everyone give it a fair examination."

STEPHEN DAILY.

We the undersigned, have examined Mr. Burke's patent, and fully concur in the foregoing statement.

A. F. MARTYN, Secretary St. Lawrence County Dairymen's Association.

E. F. TUPPER, Treas.

E. H. SOUTHWORTH.

THOS. ANDREWS.

S. W. ELDRIDGE.

R. D. HILL.

WILLIS SHATTUCK.

THOMAS HARDIN.

—o—

Mr. Timothy Lyons of Stockholm says:—

"I went to Brasher and saw the first hog-pen ever constructed after Mr. Burke's patent. I have examined it thoroughly and have since had one constructed on my own premises. I am fully satisfied that it is the best in the country, and any man within ten miles of my place, that will come and examine it and is not satisfied that it is all it is claimed to be, I will pay him for his time. It is my opinion that I will save in the fattening of my hogs this fall, three times what it cost me to build the sleeping division."

—o—

The *Courier & Freeman*, Potsdam, N. Y., says:—

"The pen is very warm, which not only keeps the animals more comfortable, but makes the cost of keeping much less than in cold pens. Those who have seen or used these pens unite in saying that they are the most comfortable residences for swine ever constructed."

—o—

Mr. John Wagstaff of Stockholm says:

"I have examined the hog-pen and find it dry, warm, and comfortable, and the best plan of a hog-pen ever invented; also I agree with the Canton Dairymen's Association when it acknowledges that it surpasses anything that they have ever seen for convenience, durability, and comfort, and further; 'I expect to save three times more in their feed, than it cost me to build those divisions.'